

## CLAIMS

### What is claimed is:

1           1.       A method of accessing information about a resource associated with a  
2 network device, comprising:  
3           receiving a request from an application for information about a resource associated  
4 with a network device;  
5           selecting a layer in a network protocol stack having multiple layers for  
6 communicating with the requested resource associated with the network device;  
7           establishing an inner layer socket for communicating at the selected layer using an  
8 inner layer application programming interface (IL API) and a socket identifier associated  
9 with the requested resource, wherein the inner layer socket communicates using the selected  
10 layer and bypasses other layers in the network protocol stack;  
11           transmitting the request for information about the resource through the inner layer  
12 socket and the socket identifier ;  
13           receiving the information about the resource in response to the transmission made  
14 through the inner layer socket; and  
15           passing the information about the resource through the inner layer socket to the  
16 application making the request.

1           2.       The method of claim 1, wherein said request includes header information  
2 associated with a transport layer and the inner layer socket is a transport socket.

1           3.       The method of claim 2, wherein the network protocol stack is compatible with  
2 TCP/IP and the transport socket is compatible with a TCP or UDP transport layer protocol.

1           4.       The method of claim 1, wherein said request includes header information  
2 associated with a network layer and the inner layer socket is a network socket.

1           5.       The method of claim 4, wherein the network protocol is compatible with  
2 TCP/IP and the network socket is compatible with an IP network layer protocol.

1           6.       The method of claim 1, wherein said request includes header information  
2 associated with a link layer and the inner layer socket is a link socket.

3           7.     The method of claim 6 wherein the network protocol is compatible with  
4     TCP/IP and the link socket is compatible with a link layer protocol.

1           8.     The method of claim 1 wherein selecting a layer in a network protocol stack  
2     further includes determining the layer in the network protocol stack that the requested  
3     resource uses for communication.

1           9.     The method of claim 1 wherein the IP layer in a TCP/IP network protocol is  
2     selected when a Internet Control Message Protocol (ICMP) resource communicates at the  
3     network layer in the network protocol.

1           10.    The method of claim 1 wherein the link layer in a TCP/IP network protocol is  
2     selected when an Address Resolution Protocol (ARP) resource communicates at the link  
3     layer in the network protocol.

1           11.    The method of claim 1 wherein the physical layer in a network protocol is  
2     selected when a physical port resource uses the physical layer for communication.

1           12.    The method of claim 1 wherein the IL API provides a transport socket to  
2     access transport layer information in the network protocol, a network socket to access  
3     network layer information in the network protocol, a link socket to access link layer  
4     information in the network protocol, and a physical socket to access physical port  
5     information in the network protocol.

1           13.    The method of claim 1 wherein the IL API provides a different socket  
2     communication interface for each layer of communication available in the network protocol.

1           14.    The method of claim 1 wherein an application communicates with the IL API  
2     using object –oriented instructions and the IL API interfaces with the network protocol  
3     through instructions executable on a virtual-machine compatible with the network protocol  
4     stack.

1           15.    The method of claim 13 wherein the object-oriented instructions are  
2     compatible with the Java programming language.

1           16.     An apparatus for accessing information about a resource associated with a  
2 network device, comprises:  
3           a processor;  
4           a memory for storing instructions when executed on the processor that causes the  
5 processor to,  
6           receive a request from an application for information about a resource associated with  
7 a network device;  
8           select a layer in a network protocol stack having multiple layers for communicating  
9 with the requested resource associated with the network device;  
10          establish an inner layer socket for communicating at the selected layer using an inner  
11 layer application programming interface (IL API) and a socket identifier associated with the  
12 requested resource, wherein the inner layer socket communicates using the selected layer and  
13 bypasses other layers in the network protocol stack;  
14          transmit the request for information about the resource through the inner layer socket  
15 and the socket identifier ;  
16          receive the information about the resource in response to the transmission made  
17 through the inner layer socket; and  
18          pass the information about the resource through the inner layer socket to the  
19 application making the request.

1           17.     The apparatus of claim 16, wherein said request includes header information  
2 associated with a transport layer and the inner layer socket is a transport socket.

1           18.     The apparatus of claim 17 wherein the network protocol stack is compatible  
2 with TCP/IP and the transport socket is compatible with a TCP or UDP transport layer  
3 protocol.

1           19.     The apparatus of claim 16, wherein said request includes header information  
2 associated with a network layer and the inner layer socket is a network socket.

1           20.     The apparatus of claim 19 wherein the network protocol is compatible with  
2 TCP/IP and the network socket is compatible with an IP network layer protocol.

1           21.     The apparatus of claim 16, wherein said request includes header information  
2 associated with a link layer and the inner layer socket is a link socket.

1           22.     The apparatus of claim 21 wherein the network protocol is compatible with  
2 TCP/IP and the link socket is compatible with a link layer protocol.

1           23.     The apparatus of claim 16 wherein selecting a layer in a network protocol  
2 stack further includes determining the layer in the network protocol stack that the requested  
3 resource uses for communication.

1           24.     The apparatus of claim 16 wherein the IP layer in a TCP/IP network protocol  
2 is selected when a Internet Control Message Protocol (ICMP) resource communicates at the  
3 network layer in the network protocol.

1           25.     The apparatus of claim 16 wherein the link layer in a TCP/IP network  
2 protocol is selected when an Address Resolution Protocol (ARP) resource communicates at  
3 the link layer in the network protocol.

1           26.     The apparatus of claim 16 wherein the physical layer in a network protocol is  
2 selected when a physical port resource uses the physical layer for communication.

1           27.     The apparatus of claim 16 wherein the IL API provides a transport socket to  
2 access transport layer information in the network protocol, a network socket to access  
3 network layer information in the network protocol, a link socket to access link layer  
4 information in the network protocol, and a physical socket to access physical port  
5 information in the network protocol.

1           28.     The apparatus of claim 16 wherein the IL API provides a different socket  
2 communication interface for each layer of communication available in the network protocol.

1           29.     The apparatus of claim 16 wherein an application communicates with the IL  
2 API using object-oriented instructions and the IL API interfaces with the network protocol  
3 through instructions executable on a virtual-machine compatible with the network protocol  
4 stack.

1           30.    The apparatus of claim 29 wherein the object-oriented instructions are  
2 compatible with the Java programming language.

1           31.    An apparatus for accessing information about a resource associated with a  
2 network device, comprising:

3               means for receiving a request from an application for information about a resource  
4 associated with a network device;

5               means for selecting a layer in a network protocol stack having multiple layers for  
6 communicating with the requested resource associated with the network device;

7               means for establishing an inner layer socket for communicating at the selected layer  
8 using an inner layer application programming interface (IL API) and a socket identifier  
9 associated with the requested resource, wherein the inner layer socket communicates using  
10 the selected layer and bypasses other layers in the network protocol stack;

11              means for transmitting the request for information about the resource through the  
12 inner layer socket and the socket identifier ;

13              means for receiving the information about the resource in response to the  
14 transmission made through the inner layer socket; and

15              passing the information about the resource through the inner layer socket to the  
16 application making the request.

1           32.    A computer program, tangibly stored on a computer-readable medium,  
2 comprising instructions for accessing information about a resource associated with a network  
3 device, comprising:

4               receiving a request from an application for information about a resource associated  
5 with a network device;

6               selecting a layer in a network protocol stack having multiple layers for  
7 communicating with the requested resource associated with the network device;

8               establishing an inner layer socket for communicating at the selected layer using an  
9 inner layer application programming interface (IL API) and a socket identifier associated  
10 with the requested resource, wherein the inner layer socket communicates using the selected  
11 layer and bypasses other layers in the network protocol stack;

12              transmitting the request for information about the resource through the inner layer  
13 socket and the socket identifier ;

14 receiving the information about the resource in response to the transmission made  
15 through the inner layer socket; and  
16 passing the information about the resource through the inner layer socket to the  
17 application making the request.